

Honey, I Shrunk the Carrots

Carrot Osmosis Activity



STANDARD 3200-03 Students will understand structure and function of cells and organisms.

OBJECTIVE 3200-0302 Investigate cellular structures and functions.

Intended Learning Outcomes:

- 1a, d. Make observations, measurements, estimations and predictions based on current knowledge.
- 2a. Identify variables and describe relationships between them.
- 5a. Know science terminology appropriate to grade level.
- 6d. Construct tables, graphs, charts, diagrams, and models to describe and summarize data.
- 7c. Understand that all science is based on observation of natural phenomena, but that all observations are influenced by the observer's prior knowledge, experience, and theoretical perspective.

Background:

- Learner should know the main parts of a cell.
- Learner should understand particle movement.

Summary:

Students will use carrots as cell models and demonstrate diffusion and osmosis.

Students will measure and observe the changes in the mass and size of the carrot.

Materials:

- Two 400 mL beakers
- string
- measuring tape or meter stick
- salt
- distilled water
- triple beam balance
- carrots

Safety concerns:



Teachers and students, be sure to keep all Glass, Chemical, and Sharp instrument Safety Rules that are specified by the teacher and in all general laboratory experiences.

Student Procedures:



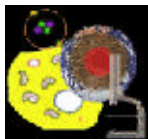
Carrot Experiment

1. Fill two beakers with equal amounts of water.
2. Add 15 g salt to one beaker and label it "Salt Water".
3. Cut a carrot in half. Tightly tie a piece of string two cm below the cut end of both pieces.
4. Place one carrot half (cut end down) in the "Salt Water" beaker. Place the other carrot with cut end down in the "Fresh Water" beaker. Allow carrots to remain undisturbed for 24 hours. Students form a hypothesis. Remove carrots and observe them and the tightness of the strings. Record data.
5. At the conclusion of your experiment, answer the following questions (realize that some require deeper thinking than others?)

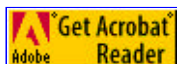
- Did the thread become loose in fresh water or salt water?
- Did the thread become tight thread in fresh water or salt water?
- Did the carrot develop a soft texture in fresh water or salt water?
- Did the carrot develop a firm texture in fresh water or salt water?
- In which type of water did the carrot cells increase in cell size (freshwater or salt water?)
- In which type of water did the carrot cells decrease in cell size (freshwater or salt water?)
- Was there a loss of water by cells in fresh water or salt water?
- Did the cells gain of water in either fresh water or salt water?

Deeper thinking questions

- What was the purpose of having you tie thread on each carrot?
- In which kind of water did the carrot cells lose water?
 - What evidence supports your conclusion?
- In which kind of water did the carrot cells gain water?
 - What evidence did you use to determine this?
- What do you think would happen to human blood cells if they were placed in a beaker of salt water?



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Updated June 15, 2000 by: [Glen Westbrook](#)

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